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# Mind Over Matter: Evaluation of a Mindfulness-Based Stress Reduction Program for College Students

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## Abstract

### Mind Over Matter: Evaluation of A Mindfulness-Based Stress Reduction Program for College Students

By

Jim Kasper

July 23, 2018

**Background:** While there is increasing evidence for the effectiveness of mindfulness practice to reduce feelings of anxiety, depression, and stress, and elevate self-compassion and awareness, the impact of brief mindfulness programs on these domains among urban, college-aged populations has not been explored fully. The current study aims to explore the impact of a brief mindfulness program upon student experiences of both positive and negative thoughts and emotions.

**Methods:** A mixed-methods study was designed to evaluate the impact of a 6-week mindfulness-based stress reduction (MBSR) course on psychosocial outcomes among a cohort of Georgia State University students . A total of 44 students participated in the program, with 22 following through until program completion. Quantitative data were collected from these 22 participants via pre- and post- questionnaires. The measures used were: The Depression, Anxiety, and Stress Scale 21-item (DASS21), the Positive and Negative Affect Schedule (PANAS), the Mindful Attention Awareness Scale (MAAS), and the Self-Compassion Scale (SCS). Qualitative data were sourced from 6 one-on-one in-depth interviews. Statistical analyses (paired sample t-tests) were conducted using SPSS. Qualitative data were analyzed using thematic content analysis.

**Results:** A cohort (n = 22) utilizing a 6-week MBSR course showed statistically significant decreases in depression [ $t(19) = 2.21, p = 0.04, d = 0.53$ ] and stress [ $t(21) = 2.45, p = 0.02, d = 0.47$ ], and marginal decreases in anxiety [ $t(21) = 1.89, p = 0.07, d = 0.35$ ] on the DASS 21. Paired t-tests revealed significant improvements in trait/dispositional mindfulness according to the MAAS [ $t(20) = 2.66, p = 0.015, d = 0.45$ ], and significant improvements in self-compassion, according to the SCS [ $t(20) = 3.83, p = 0.001, d = 0.54$ ]. Positive and negative affect showed no significant changes. Qualitative results showed that perceived impact of the course was strong, and acceptability and efficacy were high.

**Discussion:** Results from this study suggest that college students who engage in even brief, introductory mindfulness programs may notice improvements in a number of areas, including decreases in stress, anxiety, and depression, and increases in self-compassion, and mindful awareness. Colleges and universities might benefit from instituting brief MBSR programs into their curricula or incorporating these within their counseling services. Future research is needed to better understand the most effective form such programs should take.

Mind Over Matter: Evaluation of a Mindfulness-Based Stress Reduction Program for College Students

by

Jim Kasper

B.A., Malone College

A Thesis Submitted to the Graduate Faculty  
of Georgia State University in Partial Fulfillment  
of the  
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APPROVAL PAGE

Mind Over Matter: An Evaluation of a Brief MBSR Program for College Students

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## Author's Statement Page

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Jim Kasper

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## INTRODUCTION

### 1.1 Background

The modern world is stressful, especially for individuals navigating the complexity of post-secondary educational systems. More than ever, college and university students appear to be plagued by chronic conditions that affect the mind: anxiety, depression, stress, exhaustion, overwork. The myriad burdens of classwork, homework, apprenticeships, internships, networking, job searching, writing theses and dissertations, athletics, resume-boosting activities, volunteering, working full or part time, managing relationships and families coalesce to form significant obstacles to the maintenance of good mental health. Among college students, rates of anxiety, depression, and stress are at an all-time high (Disparities in Health Care Utilization, 2018). Major Depressive Disorder (MDD) appears in some 20–30% of college students, and incidence rates have increased over the years (McIndoo, File, Preddy, Clark, & Hopko, 2016). Anxiety rates among college students are increasing, and seven out of 10 adults in the U.S. experience stress or anxiety on a daily basis (Beiter et al., 2015).

Though stress is a normal part of human life, it is becoming more prevalent among college and university students (Mackenzie et al., 2011). As of 2010, nearly 10% of university students in the United States had been treated for depression (Wolfram, 2010). By 2017, this number had jumped to almost 18% (American College Health Association, 2018). According to most recent edition of the American College Health Association's annual report, the National College Health Assessment, these numbers are even higher: close to 87% of American college students felt overwhelmed by everything they had to do, 63% felt "very lonely," nearly 52% felt that "things were hopeless," 61% felt "overwhelming anxiety," 67% felt "very sad," nearly 40% felt "so depressed that it was difficult to function," and more than one in ten had "seriously considered suicide" (American College Health Association, 2018).

The deleterious effects of mood disorders and mental illness show the importance of finding ways to lessen the burden on those who experience them. Depression and anxiety have been correlated with poor outcomes and behaviors, such as smoking, poor physical health and sleep habits, poor diet, and excessive alcohol consumption (Doom & Haeffel, 2013).

Many students turn to alcohol as a coping mechanism, to the detriment of their health and future (White & Hingson, 2014). Others may turn to self harm (Toprak, Cetin, Guven, Can, & Demircan, 2011). In fact, suicide is the second leading cause of death among college students, only behind accidental injuries (Turner, Leno, & Keller, 2013).

Many interventions have been implemented to assist students in managing the negative effects of stress, anxiety, depression, etc. Cognitive-Behavioral Therapy (CBT), for example, can be useful for challenging and changing damaging patterns of thought and behavior, and has been applied in a collegiate setting (Moss, 2003; McEntee & Halgin, 1999). Psychiatric drugs have a long history of use in helping to alleviate symptoms of depression and anxiety (Leucht, Hierl, Kissling, Dold, & Davis, 2012). Exercise (Carek, Laibstain, & Carek, 2011; Perna, Antoni, Kumar, Cruess, & Schneiderman, 1998), joining social clubs (Mason, Schmidt, Abraham, Walker, & Tercyak, 2009), volunteering (Musick & Wilson, 2003) have all been shown to reduce stress and the negative cognitions that attend stress. Though there are significant benefits to many of the above practices, the practices themselves may remain out of reach for certain individuals. Therapy may not be available, may carry the weight of social stigma, or may be financially unattainable (Vidourek, King, Nabors, & Merianos, 2014), exercise opportunities may be limited and/or the individual may be incapable of physical exertion, and opportunities to socialize or volunteer may be too “exposed,” that is, difficult to bear for a person in a chronic state of mental distress. Embarrassment, denial of a problem, and lack of social support are other factors that can affect treatment seeking behaviors (Sareen et al., 2007).



In more recent years, mindfulness-based interventions have come to the forefront of practice. One such intervention is mindfulness-based stress reduction (MBSR), an evidence-based intervention with a central focus on mindfulness. Originally developed by University of Massachusetts professor Jon Kabat-Zinn to provide relief to terminally-ill patients, MBSR has become a widely-recognized and respected program that guides participants through a series of activities that foster a greater sense of self-efficacy, mindfulness, and awareness of thoughts and emotions (Kabat-Zinn, 1990; 1996). At the core of mindfulness teaching is the cultivation of an awareness of the present moment and its attendant thoughts, sensations, and experiences. Students of mindfulness are taught to explore the present moment with openness, acceptance, curiosity, and a non-judgmental attitude. By not reacting to or attempting to change the contents of the present moment, individuals may begin to foster a more flexible, adaptive set of responses to stressors. The movement is away from over-identification and into “decentering” - a state of metacognitive awareness free of judgment (Crane et al., 2017). The idea is that an intensive engagement with the present moment will refocus the mind, energy, and will on that which is real and happening now, leading to a greater sense of agency and acceptance (Bergen-Cico & Cheon, 2013). Because oftentimes mental distress arises as a result of disordered, distorted thinking and thought patterns (Feltman, Robinson, & Ode, 2009), an engagement with the reality of the present grounds the individual in sensations and thoughts that lend themselves to stability, rationality, simplicity.

Mindfulness practice has been associated with significant reductions in depression, stress, and anxiety (Goldberg et al., 2018; Gotnik et al., 2015; Khoury, Sharma, Rush, Fournier, 2015; Bergen-Cico et al., 2013; Oman, Shapiro, Thoresen, Plante, & Flinders, 2008; Roberts & Danoff-Burg, 2010; Burris, Brechting, Salsman, & Carlson, 2009), and with producing individuals who exhibit more self-compassion and acceptance toward others (Burgoon, Berger, & Waldron, 2000; Wupperman,

Neurmann, & Axelrod, 2008). This positions mindfulness and MBSR interventions in a location to be of great benefit to struggling college students.

MBSR and related programs (mindfulness-based interventions - MBI - and mindfulness-based therapy - MBT) are typically constructed of 6 or 8 weekly sessions of between 1 to 2 hours. An instructor leads the class through a series of guided activities that engender purposeful, non-judgemental, present-focused attention (Kabat-Zinn, 1990). Programmatic elements often, but not always, include techniques such as the Body Scan, Mindfulness of Breathing, Mindful Walking, Mindful Movement and/or Yoga, and other related activities. Participants are often guided by an instructor's voice through activities that help them to disengage from the external stressors present and engage with the body. Participants take stock of how they are feeling - mentally, emotionally, physically - and learn to simply experience these sensations without judging them.

Mindfulness practice has found its way into the university systems of many U.S. states (Regehr, Glancy, & Pitts, 2013), and is becoming more well-known and accepted as an intervention for those who may not benefit from/ be able to take advantage of other interventions offered.

## 1.2 Purpose of Study

The purpose of the current study was to determine if a brief, 6-week MBSR-based introductory mindfulness practice course had an impact upon positive and negative affect constructs in Georgia State University students, and also to study their perceptions of and reactions to the program.

## 1.3 Research Questions

- Is participation in an introductory mindfulness course associated with reductions in depression, anxiety, stress, negative affect?

- Is participation in an introductory mindfulness course associated with improvements in mindful awareness, positive affect, and self-compassion?
- Do participants perceive that the program has had a positive impact upon their ability to cope with unwanted thoughts, emotions, and situations?

## LITERATURE REVIEW

### 2.1 MBSR interventions in practice

MBSR has its roots in clinical practice, beginning with UMass hospital and Kabat-Zinn's interventions with patients in chronic pain (Kabat-Zinn & Burney, 1981). A host of trials have been performed on clinical populations, by Kabat-Zinn and others (Kabat-Zinn, 1982; Lengacher et al., 2014; la Cour & Petersen, 2015). More recently, MBSR has expanded rapidly into non-clinical settings worldwide. From high schools to colleges to private venues, mindfulness is being used in a variety of settings by people looking to improve their health. A number of recent studies have been performed to assess the effects of MBSR on college and university students.

In 2017, researchers in Spain conducted a quasi-experimental controlled study on an undergraduate population at a major public university (Demarzo et al., 2017). The study compared the efficacy of an 8-week MBSR program to a control group receiving no such intervention. Presence of an acute clinical or psychiatric condition, and/or previous experience with mindfulness or another type of meditation practice in the previous six months were excluding factors. The 8-week program consisted of 2-hour weekly classes, with recommended 45 minutes per day of private home practice meditation. Pre, post (1 week after end of intervention) and 6-month follow-up measurements were taken for the 100 student sample (50 per cohort). Measurements used were: a basic demographics form, Mindful Attention Awareness Scale (MAAS), Five Facet Mindfulness Questionnaire (FFMQ), Self-Compassion Scale (SCS), Positive and Negative Affect Schedule (PANAS), Hospital Anxiety and Depression Scale

(HADS), and the Connor-Davidson Resilience Scale (CD-RISC). The researchers found statistically significant improvements for intervention participants compared to controls across a range of measures, including an increase in mindful awareness, positive affect, and decreased anxiety, and minimal improvements in negative affect and resilience.

In a 2015 non-blinded randomized control trial of 75 medical students in Malaysia, researchers compared the effects of a 5-week MBSR course to a control group receiving no treatment (Phang, Mukhtar, Ibrahim, Keng, & Mohd Sidik, 2015). The participants were mostly female, Malay, and Muslim (though they highlighted significant Chinese and Buddhist representation, too). Measures used included: a demographics form, MAAS, Perceived Stress Scale (PSS), General Health Questionnaire (GHQ), General Self-Efficacy (GSE), and a 1-item questionnaire assessing compliance with weekly practice (i.e. “How often have you been practicing over the past week?”) Baseline, follow-up, and 6 months measurements were collected. Results indicated significant improvements for intervention over controls across perceived stress scores, mental distress scores, mindfulness, and self-efficacy at post-test. Effect sizes were medium, except for mindfulness, which was small. Ninety-six percent of participants had “significant mental distress” at pre-intervention. At post, 30% had a “normal” rating for mental distress in the intervention group, and only 12% had a “normal” rating in the control group. Six-month follow-up measures showed maintenance of the significant increase in self-efficacy scores, but not for the other measures. The study authors make a case for mindfulness as treatment because it is inexpensive, private, doesn’t require doctors’ visits or prescription medications, requires few inputs, and can be delivered in groups. Furthermore, program acceptance was high, especially considering the multiethnic Malaysian population and the Buddhist roots of mindfulness, which speaks to the high acceptability of MBSR’s secularist construction in cross-cultural populations.

Another study, a randomized control study performed in 2013, focused on a MBSR intervention tailored to 2nd and 3rd term medical and psychology students at the University of Oslo and the

University of Tromso (de Vibe et al., 2013). Two hundred and eighty-eight students were randomly allocated to the MBSR intervention or to a control group receiving no intervention. Measurements were taken at baseline and 2 week post-program. Measures used were: GHQ, Maslach Burnout Inventory Student Survey (MBI-SS), Perceived Medical School Stress (PMSS), Subjective Well-Being scale (SWB), and FFMQ. The 7-week, 1.5 hour session MBSR course included a 6-hour daylong session during the final week, and 30 mins/day home practice. The program had three aims: to assess if MBSR enhanced mental health; to assess whether intervention effects were influenced by gender and other variables; to assess expectation that MBSR would increase facets of mindfulness. Students in the MBSR intervention group showed significant improvements on mental distress, well-being and on non-reactive mindfulness facet scores (non-reacting, non-judging, act aware, describe, observe).

Another study, a non-randomized pre- and post-test quasi-experimental design with matched control group at SMU, matched 16 graduate-level medical students with 15 students in a control group (Barbosa et al., 2013). The intervention was an 8-week MBSR introductory course with 2.5 hour sessions and an 8-hour daylong silent retreat. Measures were taken at baseline, post-program, and 3-week post-program follow-up, and included the Burns Anxiety Inventory (BAI), Jefferson Scale of Physician Empathy, and MBI. The results were promising: BAI scores showed a significant reduction. Eighty-five percent of the 13 experimental group students experienced diminished anxiety at both 8 and 11 weeks, moving down at least one “anxiety level” on the scale. Empathy showed a statistical increase, as well. Burnout, however, was not affected by the relatively short MBSR intervention.

An Australian study in 2015 demonstrated the efficacy of a stress management and mindfulness program for undergraduate nursing students (van der Riet, Rossiter, Kirby, Dluzewska,& Harmon, 2015). This descriptive qualitative study of Australian first year nursing and midwifery undergraduate students looked at perceptions of a seven-week stress management and mindfulness program that used one hour sessions and encouraged regular home practice. A 60-minute semi-structured, focus group interview

was performed two weeks after completion of program. Fourteen students were recruited, and 10 completed the focus group interview. Thematic content analysis identified three main themes: attending to self, attending to others, attending to the program. Participants reported positive impacts on personal, academic, and professional functioning; particularly, improved self-awareness and self-care, improved ability to “be-with” others, and a reported decrease in insomnia and increase in daytime focus.

Another study, a quasi-experimental pre/post test design performed in 2013, studied the effects of a brief (5-week) MBSR program that was integrated directly into an academic course (Bergen-Cico, Possemato, & Cheon, 2013). Participants (n = 119) were undergraduate students (treatment: n = 72; control: n = 47) enrolled in elective courses. The study aimed to compare changes in psychological health between the MBSR treatment group and a control group. Baseline and follow-up data were collected for both groups. The treatment group displayed significant improvements in psychological health compared to controls, primarily measured by mindfulness and self-compassion.

Yet another study performed by Demarzo et al. in 2014 demonstrated the significant effects of a brief mindfulness-based intervention (MBI), this time in a Brazilian population (Demarzo et al., 2014). This uncontrolled study in a Brazilian “healthy sample” of 23 university students studied the effects of a full MBSR program, 8-weeks long, 2.5 hours/session, and a retreat day. The PSS and (WHO Quality of Life questionnaire) WHOQoL-BREF were used at pre- and post-intervention. Improvements were seen across all facets of both measures; that is, stress went down, and quality of life improved after the brief MBSR intervention.

The Journal of American College Health published a study in 2017 that discussed results of a pilot program to evaluate the effectiveness and feasibility of mindfulness training in first year U.S. college students (Dvořáková, 2017). The program sought to address the high rates of stress and anxiety by the implementation of a transition-to-college mindfulness program called “Learning to Breathe”

which was based on the principles of MBSR courses. One hundred nine college freshmen participated in a brief mindfulness intervention. Participation was associated with significant increases in life satisfaction, and significant decreases in depression and anxiety. Marginally significant improvements were made in sleep and alcohol abuse issues.

A 2016 study examined the efficacy of mindfulness-based therapy for the amelioration of major depressive disorder symptoms among college students (McIndoo et al., 2016). The randomized controlled trial examined the efficacy of an abbreviated four-session mindfulness-based therapy with 50 college students. The analyses showed statistically and clinically significant improvements across various measures, including depression, stress, rumination, and mindfulness. More than 75% of the intervention group experienced clinically significant reductions in depression.

In 2008, Oman et al. conducted a randomized control trial on a small sample of college students from a public U.S. university (Oman et al., 2008). An 8-week MBSR program was implemented and stress, rumination, forgiveness, and hope were measured in 50 students. Significant improvements in stress and forgiveness, and marginal improvements in rumination, were noted.

The above studies demonstrate the potential benefits of engaging college students in introductory MBSR and/or mindfulness-based interventions. Collectively, MBSR interventions have positive impacts on mental health outcomes such as anxiety, stress, depression, rumination, and others. MBSR programs also increase the hypothesized mediators or mental health impacts including mindfulness, self-compassion, hope, empathy, and general quality of life. Despite these findings, many of the above studies were conducted on specific populations: medical students, nursing students, first year students, and students with MDD. Though several of the studies were conducted in the United States, only one was conducted on a general college population that sampled across academic degree, year of study, and age. The literature on MBSR interventions in urban public U.S. universities for a diverse college population is surprisingly thin - all the more critical when one takes into account the

diverse population a university like Georgia State attracts, and the volume of mental health concerns (trauma, for example) that they bring. This study aims to begin to fill this gap.

## METHODS AND PROCEDURES

### 3.1 Participants

The current study was open to all students attending Georgia State University (GSU). The inclusion criteria were (a) GSU students of any major, academic year, or program (faculty and staff were not invited to join either the intervention or the current study) (b) aged 18 years or older (c) willingness to participate in the study and give informed consent and (d) ability to understand and write in English. A total of 44 students signed up to participate in the 'Space to Breathe' course.

### 3.2 The Intervention

'Space to Breathe' is a mindfulness-based stress reduction (MBSR) course designed especially for students at Georgia State University. The program is based on the original 8-week MBSR course designed and offered by Jon Kabat-Zinn (Kabat-Zinn, 1996). It is offered via the Mind-Body Clinic at GSU's Counseling and Testing Center (CTC), and is free to registered GSU students. Most referrals to the course come from the CTC, which has had success in positioning the Mind-Body Clinic and its 'Space to Breathe' course as an immediate-needs measure in the face of extremely long wait times for consultations with CTC counselors. The 6-week MBSR course utilizes a weekly class-based format, with 6 individual sessions of 1 hour each, and an optional 8-hour retreat day of silent mindfulness practice. All classes are taught by a certified mindfulness instructor. The content of the 6-week program is provided in the appendix.



The course was offered on a rolling basis, with a total of 5 cohorts available during the spring semester of 2018. Students were only permitted to attend one offering of the course during the semester. The first and second offering began on February 14, 2018 (one class at 4:30 pm and another at 5:45 pm) and ended seven weeks later (one week extra to accommodate the university's spring break). The third, fourth, and fifth cohorts began one, two, and three weeks after the first course was offered, respectively.

### 3.3 Measures

#### Quantitative measures:

Assessments were administered at baseline (in-class before the start of the first class) and at 6-week follow-up (in-class at the end of the last class) Assessments were administered as paper-based questionnaires and included the following instruments:

Socio-demographic variables: Participants were asked a series of sociodemographic questions including the following: gender, age, level of schooling achieved, employment status, annual household income, race, ethnicity, marital status, utilization of services offered at the university's Counseling and Testing Center, and previous exposure to and utilization of the university's Mind-Body Clinic.

The Depression, Anxiety, and Stress Scale 21-item (DASS 21) is a 21-item self-report instrument that assesses a respondent's levels of depression, anxiety and stress over the course of the previous week (Lovibond, P.F. & Lovibond, S.H., 1995). Each item is framed in a short statement with a negative slant. (i.e. "I found it hard to wind down," "I couldn't seem to experience any positive feeling at all.")

Respondents rate their responses on a Likert-type scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). Higher scores reflect higher severity rankings of each of

the three constructs being measured. Three subscale scores are calculated for depression, anxiety, and stress.

The Mindful Attention Awareness Scale (MAAS) is a 15-item self-report instrument designed to assess individual trait (or dispositional) mindfulness (Brown & Ryan, 2008). Trait mindfulness refers to a person's tendency for mindful responding in day-to-day life. (State mindfulness, by contrast, refers to mindfulness in a given moment, which can be affected by engaging in practices like meditation, yoga, etc.) The 15 items relate to the respondent's everyday experiences and focus on how attentive or mindful they are in various scenarios. Each item is rated on a Likert-type scale between 1 (almost always) and 6 (almost never). Higher scores reflect higher levels of trait mindfulness.

The Self-Compassion Scale (SCS) is a self-report instrument composed of 26-items designed to assess self-compassion (Neff, 2003). It comprises six subscale items including: self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. These subscale items assess how a respondent perceives self-directed actions and thoughts from both positive and negative angles. The 26 items are rated using a Likert-type scale between 1 (almost never) and 5 (almost always).

The Positive and Negative Affect Schedule (PANAS) is a self-report instrument that measures positive and negative affect (Watson, Clark, & Tellegen, 1988). The questionnaire consists of a simple bulleted list of 20 words that people often use to describe how they are feeling or what they are thinking. Words on the list include both positive and negative adjectives, such as "interested," "scared," "jittery," "inspired," etc. Respondents must choose their experience with each adjective over the past week and rank it on a Likert-type scale between 1 (very slightly or not at all) and 5 (extremely). Positive and negative affect are then scored individually, with higher scores representing higher positive affect and lower negative affect, respectively.

## Qualitative Measures

To further assess the impact of the mindfulness intervention upon those who completed the course, semi-structured individual interviews were conducted. All interviews were conducted by the study author, utilizing a digital recorder. Interviews took place in a private and quiet corner of a student lounge on campus. Theoretical data saturation was achieved by engaging participants in a total of 6 interviews, which ranged in length from 30 minutes - one hour. The nature of the interviews allowed for an organic development of questions based on responses garnered, through an interview guide was followed to ensure that the questions of primary importance were addressed in the course of the interview. (See Appendix A). Topics included how participants became engaged in the program, experiences with the program, discussion of program content, suggestions for modifications, and perceived impact of the program, among others.

### 3.4 Analysis

Quantitative analyses were conducted using IBM SPSS Statistics 24. We conducted descriptive statistics tests to examine the sociodemographics of the study population. We also conducted paired sample t-tests to examine whether there were significant changes from baseline to follow-up on key outcomes of interest (e.g. depression, anxiety, stress).

Qualitative analyses were conducted by the study team using pen and paper. Individual in-depth interviews were transcribed by the study author using free open-access transcription assistance software from itranscribe.com. The study authors developed and refined a codebook that was used to guide the analysis. Two members of the study team individually coded each of the six transcripts using a thematic content analysis. This allowed for a minimization of bias while examining the transcripts for the six content areas - or codes - that had been pre-selected by the study team. The two members met to

discuss and reconcile differences in findings once their individual analyses of the transcripts had been performed.

## RESULTS

In total, 44 students signed up for the 6-week 'Space to Breathe' course and completed baseline measures. Twenty-two students completed the course, and completed both baseline and post-program measures. The other 22 students were lost to follow-up. (Most of these did not return to class two of the program.) When compared, those who completed the program and those who did not showed no significant difference on sociodemographic characteristics. However, when pre-test measures were compared, significant differences were made apparent. Those who did not complete the program had significantly higher levels of stress, anxiety, and depression, and significantly lower levels of mindful awareness and self-compassion. (See Table 3 for a complete breakdown of pre-test comparisons between the two groups.) Three participants did not provide sociodemographic data.

### 4.1 Participant Characteristics

The majority of participants were female, between the ages of 21-29, and had completed some college, but did not yet have a degree. Most were working part-time (<40 hours per week), with an annual household income between \$10,000-\$50,000. A small majority (36%) self-identified as white, while nearly as many (34%) self-identified as black/African American. A majority of participants had previously utilized services (therapy, including group therapy) at the Counseling and Testing Center, but most had not had prior exposure to the Mind-Body Clinic.

(See Table 1 for a full sociodemographic report.)

### 4.2 Quantitative findings

Results from the paired sample t-tests indicate that there was a significant decrease in depression from baseline ( $M = 9.40$ ,  $SD = 8.34$ ) to follow-up ( $M = 5.40$ ,  $SD = 6.72$ );  $t(19) = 2.21$ ,  $p = 0.04$ ,  $d = 0.53$ . There was also a marginally significant decrease in anxiety from baseline ( $M = 12.30$ ,  $SD = 10.40$ ) to follow-up ( $M = 8.82$ ,  $SD = 9.30$ );  $t(21) = 1.90$ ,  $p = 0.07$ ,  $d = 0.35$ . Stress decreased from baseline ( $M = 16.82$ ,  $SD = 10.12$ ) to follow-up ( $M = 12.45$ ,  $SD = 8.60$ );  $t(21) = 2.45$ ,  $p = 0.02$ ,  $d = 0.47$ . Negative affect showed nominal, non-significant reduction from baseline ( $M = 19.45$ ,  $SD = 7.00$ ) to follow-up ( $M = 17.20$ ,  $SD = 6.20$ );  $t(21) = 1.42$ ,  $p = 0.20$ ,  $d = 0.34$ ; there was no significant difference from baseline ( $M = 31.80$ ,  $SD = 8.80$ ) to follow-up ( $M = 31.73$ ,  $SD = 8.50$ ) for positive affect [ $t(21) = 0.02$ ,  $p = 0.98$ ,  $d = 0.01$ ]. There was a significant improvement from baseline ( $M = 54.24$ ,  $SD = 12.91$ ) to follow-up ( $M = 59.62$ ,  $SD = 10.93$ ) for trait/dispositional mindfulness [ $t(20) = 2.70$ ,  $p = 0.015$ ,  $d = 0.45$ ]. There was also a significant increase in self-compassion from baseline ( $M = 80.00$ ,  $SD = 21.71$ ) to follow-up ( $M = 91.20$ ,  $SD = 19.60$ ); [ $t(20) = 3.83$ ,  $p = 0.001$ ,  $d = 0.54$ ].

(See Table 2 in for full quantitative results.)

#### 4.3 Qualitative findings

Of the six in-depth, semi-structured individual interviews conducted, five were with females. Four of the interviews were with undergraduate students, and two with graduate students. Two of the interviewees identified as non-white, and one as ethnically Latino. Their programs of study were of varying disciplines, but all were located within the sciences. Each of the six participants reported similar motivations for joining the class: a stress-filled academic journey had spurred them to take actions to find ways to take control of their mental health, which led them to the university's Counseling and Testing Center, which, in turn, had pointed out the mindfulness class.

Six themes were identified:

##### 1. Reasons/motivations for taking the class

2. Positive experiences with the class (e.g., what participants like about it, what was helpful about it)
3. Negative experiences with the class (e.g. what participants didn't like about it, what was not helpful)
4. Suggestions for changes/modifications to the class
5. Personal practices (e.g., practices occurring outside the structured class environment, plans to continue practicing when class is over)
6. Perceived impact, effect of the class

### **1. Reasons/motivations for taking the class**

Participants indicated several reasons for taking the class. For example, participants expressed concern over the long wait times to see a school therapist at the CTC, and were willing to seek other forms of help. One participant commented that,

"I was trying to get a counseling appointment at the counseling and testing center. They have a backlog like 12 weeks... but they said, well there's this group-based program that uses mindfulness... and I said I'm absolutely interested, especially if I have to wait up to 12 weeks potentially for counseling appointment, so sign me up."

A number of interviewees expressed significant, ongoing issues with anxiety and/or panic attacks. They viewed the class as an opportunity to learn a new coping skill to help with anxiety and panic. For example, one participant commented that,

"I was kinda having a hard time, uh, like with my coaches and just the routine of practicing for more than 20 hours a week, uh, studying, like taking all the science classes cause I'm a neuro major, and, um,

it got to a point where I was starting to have panic attacks before going to practice. And I was like "okay, there's, something's wrong, I need help."

Likewise, general stress reduction was a significant reason for many for seeking help in the form of the mindfulness class. One participant spoke about significant levels of academic stress resulting in physical symptoms,

"I've always been like, I am a perfectionist type of person, um, and I realized recently that it's okay to want to do well but it should not be impacting your health to want to do well... And I like have heartburn issues, and if I am stressed it gets far, far worse."

Other students spoke of the excitement of finding a place to be able to practice mindfulness in a structured format,

"So I got an email about it, and I was like, you know, that actually sounds pretty, pretty good. Um, mindfulness is something that like, uh, I talked about with a variety of different therapists as well. I have some, uh, pretty gnarly anxiety issues that crop up more when I'm in school than when I'm not. But like, it was never something that like they necessarily specialized in, or like, anything like that. Uh, so, actually getting to sit down and, uh, you know, an hour a week to a class on it seemed like a good idea."

Another student spoke along the same lines,

"So basically I've been always interested in meditation and mindfulness, for a long time ago, and I decided to, you know, just go the first day and that's how it all started."

Still others viewed it as a welcome respite from the daily academic grind,

“I really like it... just to get away from the in-class activities. I just like to get away from all of that for just a bit during the week.”

## **2. Positive experiences with the class**

Participants praised the class for its many strengths, beginning with its strong leadership,

“Linnie is amazing! I'll say that, to her face, she's amazing. She's a very good teacher, you can tell she's very well informed, she's knowledgeable, she knows her stuff, and you can tell she has years of training and education on the subject. Um, I also think that she has a great voice for leading the practice, which is important.”

Likewise, they expressed their pleasure with the atmosphere that was fostered within the class,

“The environment and the atmosphere of Space to Breathe is extremely positive, encouraging, and open, and she encourages questions to be asked and for people to share their experiences, and I love that.”

Accessibility was an important issue for many, as schedules and commitments varied considerably, and access to classes was of tantamount importance to a busy student population. One student said,



“I like how many times she has available for different people with different schedules. And she lets you come in even if you're gonna be late, she doesn't want you to not come. If you have to leave early, she understands. It's just a very accepting environment, and Linnie has created it that way purposefully, and I think she's done a really amazing job with it.”

The full-day silent retreat was a favorite among those who were able to attend. One participant could not withhold her excitement,

“Woooo! The retreat was phenomenal. I wanted to live there. It was phenomenal. It was a full day of silence and a beautiful, scenic getaway that is a place that GSU owns... phenomenal.”

The retreat day also offered a chance for self-reflection and contemplation, which was put into words by one participant who attended,

“The retreat, um, instead of like running away from these like past or these moments in the past, I tackled them head on, I was mindful about these thoughts, instead of like ignoring them or like avoiding them, I was like mindful of what was actually in my head, and telling myself this is happening, it's okay, just fix it, work on it.”

Participants also enjoyed sharing with their peers and finding a space to connect and learn from the experiences of others. One student spoke of this environment,

“What I really like was that... this was like an opportunity to... kinda see other people's perspectives. That's a nice experience because you can share all, how do you feel, you can hear from other people what other people feel, so I feel that that group environment, it was really helpful.”

The class itself provided a quiet, calming atmosphere for meditation and introspection. The very act of meditating can bring about stress relief and calm (Kerrigan et al., 2017). Participants spoke of feeling relaxed after leaving the class, able to put some distance between their stressors. One participant said,

“It's night and day between going in and leaving. Cause a lot of the times I am walking there completely stressed out of my mind, and I leave feeling completely different, or I've got more perspective, or I'm just calmer and I can deal with it better, have the capacity to deal with it.”

Pizza and snacks were provided during the first and last class sessions, offering extra incentive to join. One student mentioned,

“Plus there was pizza. That was cool. (laughs) And the promise of future pizza, which you know, I'm all about free pizza.”

Finally, the class offered a space for students to work on tough issues, some of which relate to self-image. One student in particular talked about one such moment,

“I actually realized that I do love myself, that I do have self-worth, and that I forgave those who have hurt me in the past, and those are things I never knew I would actually do in my entire life.”

### **3. Negative experiences with the class**

Though there were few overall mentions of negative experiences within the class, there were a handful of issues that participants felt compelled to share during the interviews. Group dynamics and time use were of concern to a number of participants, with one interviewee speaking frankly,

“In some classes there were individuals who were faced with certain challenges, and were working through those challenges, and they worked through their challenges in class, and it could have been a little bit disruptive to the process for other people... Sometimes you're kind of like, "okay, I'd like to get to another practice, but this person is speaking a lot and telling a story about what's bothering them over the past week or whatever." So it can be disruptive and distracting.”

Likewise, group discussions were perceived to be uncomfortable and unstructured for a number of participants. One participant spoke about this,

“I guess I like, I like the discussion part less. Um, cause I don't know, I guess I, I felt kind of like uncomfortable with sharing my own thoughts, and I was like, nobody would talk and then I felt I need to say something and cause I can't do like awkward silences, so I have to jump in and say something, and then I feel like kinda weird... Sometimes I would prefer to talk less and just, you know, kinda really concentrate on one thing.”

A consistent space to practice was also an issue. Due to the nascent nature of the Mind-Body Clinic and the Space to Breathe program at GSU, a proper, fully-equipped and allocated classroom is not yet available for permanent, continued use. This resulted in the class location and time being changed on a weekly basis, sometimes meaning a hike across town to a different part of campus to use a room that

was not equipped to suitably contain a mindfulness class. Another participant weighed in on this, expressing concern,

“Maybe, uh, have like better rooms for that, cause it was kinda like, we were kinda like moving around rooms, every time was like in a different place, um, most of the time it was like in a really closed room with like no windows and, like, or in a classroom like around a table. I think that would be like, I think it would be better if it was just like, kind of like, a more chill environment, like maybe, I don't know, big bean bags, or I don't know. Just, kind of like a more suited environment that's dedicated only to that.”

Similar thoughts were expressed by another participant,

“With the rooms and stuff there were definitely issues... we had a different room the first time and the fourth time than we did all the rest of the times, and then the room that we were in most of the time we always had to come in and rearrange the chairs and the tables because everything was just in the way.”

Lastly, though most of the interviews demonstrated the strength of the communications and emails sent out by the instructor, one participant had an issue with timing,

“I think usually there were reminder emails but I think they were usually morning of, and for most people I think it would be beneficial to have it like the day before.”

#### **4. Suggestions for changes/modifications to the class**

Suggestions were solicited directly from each participant during the interviews. As evidenced above by some of the complaints with the space, there were numerous calls for finding a suitable classroom that

would not fluctuate by week, and something with plenty of space to spread out and relax. One participant painted a clear picture,

“Toward the end it was getting tight. It was getting full... I think she needs like... a big wide open space. Like, almost at the retreat, and just sit where they want - spread out, lie down, sit up, whatever they want - and practice. Whereas, we, we, I don't really think that there was space at CTC to facilitate it. There's a room that we started using toward the end which was lovely. Super relaxing, beautiful space, but, I think it's gonna be too small. I foresee that there's gonna be more people doing this, and that's not gonna hold them. So that's my only feedback, is you need more space.”

Perhaps surprisingly, more of the actual meditation practice was hailed by more than one participant as one thing that was missing. One participant speaking on the issue said,

“I think, um, it would be nice to have more meditation practices, in that's what now that, uh, the schedule for the students is kind of hectic to program, but maybe, maybe having a little bit more of time to, for meditation practice.”

Another student suggested expanding upon the program,

“It should be like the whole semester, not just six weeks. Honestly, I think it would be, even if it were, like it wouldn't necessarily have to be a class like this where you have to be there every week, but I think just like multiple times so that like you can go whenever you can go, and that, like, multiple times a week so that whoever can go whenever. And just like have that every week... So like you can just like drop in and meditate.”

Mentions of wanting more background information on the beneficial aspects of meditating - and the biological processes underlying it - were expressed. One participant, a neuroscience major, made an argument for this, stating,

“I think, more science behind and benefits of specific practices... That would be really interesting. Um, especially, I mean she wouldn't have to get too sciency, cause I don't know if she would like know all of it, but like I'm a neuro major so, that would just be really awesome I think.”

Though some interviewees talked at length about how they fit the practices they had been learning into their daily lives, several had trouble seeing the connection, and desired a more explicit set of suggestions for how to incorporate mindfulness in their daily activities. One in particular mentioned the following,

“More of the applications in daily life. I think sometimes people think that meditation or mindfulness is just to be in the lotus position and just, having a belief and all of that, but it goes beyond that, you know?”

Though the retreat was a universally positive experience, some participants were not able to attend based upon the timing. Since it was scheduled close to the end of the term, some felt that they could not attend without encroaching upon priceless study time,

“I really wanted to go, but it was a long day, so I couldn't make it... I was just pretty much concerned about the length of the day... Cause I had a test that Monday, so I really needed those hours, you know, to study... You know, maybe next time it's possible to do it during the break or something.”

The university's Counseling and Testing Center provided the initial contact with Space to Breathe for many of the participants. There were worries over how other students who might need the class would hear about it. One student expressed concern by questioning,

"I know that if it wasn't for that [the Counseling and Testing Center] I don't know exactly how would I, how would I have found out about the course? I don't know. Maybe posters?"

As mentioned previously, the unstructured nature of some of the group discussions following a meditation session were cause for concern. A few students mentioned structuring them so as to allow for clear expectations and outcomes. One in particular said,

"I want discussion to be a little more structured, if that makes sense... So, some direction, or like trying to think of some more structured, like, questions to ask people who might not say anything because they don't really know, like, what we're looking for... Like, we definitely had a lot of sessions where she was like, "so, how was that? Like, how'd that go?" And we'd all just sit there in silence for a while. (laughs)"

From time to time, changes to room assignments and/or class times had to be made. Though these were often unforeseen, the class participants were clear that notifications to alterations should be made with as much time as possible. One said,

"Um, and then because of those changes we would often get like last minute emails. About like, "we're actually going to be in this room today!" So, that could be a little frustrating. So I think usually there

were reminder emails but I think they were usually morning of, and for most people I think it would be beneficial to have it like the day before.”

## **5. Personal practices**

Participants shared what had helped them to incorporate elements of mindfulness practice into their daily routines. They mentioned specific techniques and practices that were particularly useful - the S.T.O.P practice (Stop, Take a breath, Observe, Proceed), Awareness of breathing, the Body Scan, and daily app-based guided meditations. One participant, in particular, was excited about his newfound abilities to bring mindfulness into his daily activities,

“I tried to practice mindfulness as much as I can, but what I tried to do is that I tried to implement it in my daily life, so, for example, I like to go to the gym a lot, go to a treadmill to walk, so every time I'm walking, I'm trying to be very mindful about, "what am I doing? How is my body, uh, functioning? How am I moving?" But I'm trying to focus more on the experience and just to be completely present, at the moment, and just not thinking about other stuff, when I'm doing something specific.”

Another shared her experiences with bringing her attention back to the present moment even in the midst of commuting to class. When asked if she had managed to take mindfulness “with her” in her daily life, she responded,

“Um, more when we touched a little bit more on the mindful walking, things like that, I tried to concentrate on like trees or, uh, just how I walk, my pace, things like that. I stopped, uh, going to class with my headphones on. Just tried to like, you know, experience the walk.”



## **6. Perceived impact/effect of the class**

Participants spoke openly about the therapeutic effects of class itself, and the diverse ways in which it had impacted their lives. One participant expressed surprise over how useful the program had been,

“I kinda thought of it [Space to Breathe] as maybe a stop-gap between just the wait period and starting something [talk therapy], but it ended up being therapeutic in and of itself. So, it turned out to be much better than my, than I had expected.”

Others talked about the effect the class had upon helping them to ground themselves and their emotions and thoughts in the present. One student talked about the power inherent in this approach,

“And I think that's also getting at why mindfulness is powerful. Because there's nothing really bothering you in the here and now. Everything that bothers you is the past or the future. And your concern about those things. The present moment has very little worry, unless you're in immediate danger or immediate harm.”

Others spoke about the impact the class had upon assisting them in finding answers to questions, and providing a platform for significant gains or shifts in perspective. One participant stated,

“Sometimes I'm searching for an answer and I, you know, wrack my brain trying to figure it out, work through something, solve a problem - you go to mindfulness and the answer comes to you... Just because you stopped. You just stopped banging your head against the wall for a second and all of a sudden the answer came to you, like oh my god, that's all I had to do: was just pull back a little bit.”

Still others were impressed with the provision of having gained what they viewed as a lifelong skill set.

This participant said it this way,

“I feel that it's almost like a skill. Like, something that you have to practice, and something that you have to develop, and it's something that you're gonna have, like, for the rest of your life. So, it's important.”

For several participants, noticeable sleep improvements resulted from taking time to practice mindfulness. One of the interviewees spoke of significant hurdles that had been overcome,

“My second year of school, it was really stressful. It was really stressful, I was having problems sleeping, I had insomnia, I was so stressed for my grades because I want to always have, you know, get good grades and that, I feel that practicing really helps me to just calm down.”

Acceptance and Non-judgement were taught in the class, and our interviews revealed the extent to which these practices had been adopted by the participants. One interviewee painted a picture for us,

“Now I'm able to, first of all recognize my anxiety and just like can accept it more. Cause I feel like I... I used to like push these feelings like kinda down and be like... judging myself all the time, and I feel now I'm like, “okay, I'm anxious, what do I do now?” Just breathe, like just acknowledge the fact that anxiety is just, just a part of all the normal range of emotions we're experiencing, um, so I think it kinda helped me to just not get down on myself as much and just not to judge myself... Um, so I guess that kinda made me be more like, at peace with that.”

Mindfulness practice as more than a complementary therapy came up a number of times throughout our interviews. One of the participants revealed,

“It has made like such a positive impact in my life. Like meditation alone. Like I do counseling sessions and it's great, like they help me like realize things, but meditation, I think that's like the big takeaway here, that is the one that really affected my life, and made me like realize that I could actually do things, like step by step instead of being like overwhelmed, and feeling more accomplished and more self confident.”

Help for anxiety reduction was a common refrain throughout all the interviews. One student said it best,

“It helps to stop the runaway train. Cause like, even if you do have anxious thoughts, you're like saying, "well I'm having this thought." And if you're paying attention to having that thought rather than running off the rails, um, panic attacks don't happen.”

Another mentioned similar personal results,

“It's very useful for like dealing with more like crisis situations, like, good for like mental health maintenance as well, so like, you know if you're starting to have a panic attack, being able to be mindful of like what's going on can help like respond to that, like, physical and mental, like, out-of-controlness.”

Another student had similar things to say of the power of mindfulness in moments of acute anxiety,

“Yeah, definitely a life-changer (laughs). If it wasn't for mindfulness, I would probably still be having panic attacks like a lot... but you meditate, and it stops.”

Taking time to pause was a recurrent theme, one which helped to identify, accept, and normalize stress. One participant talked about this process,

“I'll notice myself start to get stressed, and that's when I'll be like “stop, take a deep breath.” Um, and sometimes I have to like continue with whatever it is I'm doing that's stressing me out because I just have to do it, but I can usually then like pause every now and then to just be a human.”

The class focused in turn on self-love and forgiveness, powerful tools for positive mental health. One of our interviews revealed how a participant thought in new, constructive ways about herself after a recent, undesirable medical diagnosis,

“I never realized how much I actually cared for myself. And that was like the first time [at the retreat] I genuinely said “I love you” to myself too, so it's like, it blew my mind honestly. I learned to accept things and just to love myself and love people, notice my self worth... I'm still trying to learn how to like live life, cause after the diagnosis, it's like a whole different ballpark for me, but before that I'd been suffering depression for like as long as I can remember, so there was really no self-love there, so this was the first time.”

Another participant spoke of similar positive self-image results,

“My favorite thing she [the instructor] said during this class is, “stop shoulding on yourself.” That was honestly probably the most impactful thing she said, cause it made me realize how much I do say, like, ‘I should.’”

Mindfulness has a positive impact on studying, focus, grades, and confidence. Academics improved for a number of participants. One shares her story below,

“I'm quite happy. I'm not failing a single class. And last school year, I actually failed like 3 classes and then last semester I was like “ok, time to get serious,” and um, I still wasn't good enough, but this semester like, yeah I got this. Grades have definitely improved. I'm in more control of everything. I'm realizing that I can do these things.”

When asked about possible negative side-effects of mindfulness practice, participants struggled to provide answers. Several referenced a sort of involuntary self-knowledge that might be obtained while a participant was “not yet ready” to deal with it. Even so, this was couched in terms of overall positive movement, and not a barrier to taking up a mindfulness practice. One participant explained her views as such,

“[When being mindful] You might find something out. I mean, you might find out you might need to leave your partner. But you know what I mean? You might become aware of a situation in your life that needs to change. Or you might become aware of the fact you need to disrupt something in your life and that's not an easy thing to do. You might realize you need to quit your job. So, in that way I think some people might see that as a drawback. I don't.”

All interviewees were aware of the benefits that practicing mindfulness had brought them, and talked of their plans to continue practicing mindfulness meditation.

## DISCUSSION AND CONCLUSION

Attending college has become more stressful in recent years (Pryor, Hurtado, DeAngelo, Palucki Blake, & Tran, 2010). College students experience significant burdens of stress, anxiety, and depression (Beiter et al., 2015), leading to myriad negative outcomes, ranging from poor performance, to dropping out, and even alcohol abuse and dependence, and suicide (Watson, Black, & Hunter, 2016).

Though numerous interventions have been successfully implemented among university populations, not all of these are suited for every student, and some are simply out of reach for a variety of reasons (Sareen et al., 2007). Mindfulness-based stress reduction (MBSR) courses have been shown to positively impact student performance and levels of stress, anxiety, and depression (Bergen-Cico & Cheon, 2013; Oman et al., 2008). The current study examined a brief (6-session) MBSR intervention at a public, urban university.

Though the present research study cohort was relatively small, positive outcomes were noted across a number of psychosocial measures, including for stress, anxiety, depression, positive and negative affect, self-compassion, and mindfulness. Our findings were congruent with other past research with this population (McIndoo et al., 2016; Bergen-Cico & Cheon, 2013; Oman et al., 2008; Roberts & Danoff-Burg, 2010; Burris et al., 2009; Demarzo et al., 2017; Phang et al., 2015; de Vibe et al., 2014; van der Riet et al., 2015; Bergen-Cico et al., 2013; Demarzo et al., 2014; Dvořáková et al., 2017).

The present study found significant decreases in depression from baseline to follow-up among program completers. This finding is consistent with prior studies conducted by McIndoo et al., 2016 and Dvořáková et al., 2017, which similarly reported decreases in depression. Stress showed significant improvements after the MBSR intervention as well, along the lines of studies conducted by McIndoo et

al., 2016, Oman et al., 2008, Roberts & Danoff-Burg, 2010, and Phang et al., 2015. Mindfulness, too, increased significantly as a result of the intervention, with improvements in mindful attention and awareness, similar to recent studies (McIndoo et al., 2016; Bergen-Cico & Cheon, 2013; Demarzo et al., 2017; and Phang et al., 2015). Likewise, self-compassion showed statistically significant increases, in line with two recent studies (Bergen-Cico & Cheon, 2013; Phang et al., 2015). Anxiety scores dropped marginally, which was also in line with a number of recent studies (McIndoo et al., 2016; Bergen-Cico & Cheon, 2013; Demarzo et al., 2017). It is important to note, however, that two studies showed significant results for anxiety, perhaps as a result of utilizing different measures than those used in the current study (Barbosa et al., 2013; Dvořáková et al., 2017). Positive and negative affect remained unchanged from baseline to follow-up. This is congruent with a previous study conducted by Demarzo and colleagues (Demarzo et al., 2017).

Of note, too, is the fact that, when compared, the “completers” versus those who dropped out of the course differed significantly on pre-test outcomes. These included stress, anxiety, depression, mindful awareness, and self-compassion. (No difference was shown for positive and negative affect.) This suggests that participants who stuck with the course were more well-positioned than their more anxious, depressed counterparts to follow-through on coming to class on a weekly basis. A number of studies have demonstrated similarly frustrating findings: those individuals who are most in need of mental health interventions are precisely those who are not retained by them (Fischer, Dornelas, & Goethe, 2001; Thormählen, Weinryb, Norén, Vinnars, & Bågedahl-Strindlund, 2003; Lamers et al., 2012). This likely impacted our results, in that completers tended to be, relatively speaking, higher-functioning than non-completers. It is not implausible that this skewed our findings, reflecting perhaps a less optimistic set of results than might have otherwise been garnered had all 44 participants remained enrolled in the class.

Overall, our qualitative findings were informative, optimistic, and on par with similar qualitative studies of this topic (Aherne et al., 2016; Dariotis et al., 2016; Kerrigan et al., 2017; van der Riet et al., 2015). We could identify with the findings of Aherne et al., who spoke of an MBSR intervention that was well-received by participants and boasted a high level of satisfaction. Simultaneously, feedback from that study revealed a demand for more in-class mindfulness practice and more focused discussions, themes that arose in our analysis on multiple occasions. Likewise, Dairotis et al., along with the current study, demonstrated the efficacy of a the program in producing individuals with a greater ability to identify negative cognitions and emotionally regulate. Both studies implicated the need for content refining in the area of more structured discussions of specific issues (i.e. stress, exam anxiety).

The current study also uncovered the incredible burden that university attendance places on the individual - class workloads are compounded by extra curricular activities, jobs, assistantships, family responsibilities, etc. The insertion of a MBSR course into the mix offered an opportunity to slow down the pace of life, if briefly, and gain perspective, answer unsolved questions, and provide concrete examples and practices to counter the effects of these multiple stressors. Kerrigan et al. found strikingly similar results in their 2017 study at a highly-ranked U.S. university (Kerrigan et al., 2017).

Our study also showed similar outcomes to an Australian qualitative study conducted in 2015 (van der Riet et al., 2015). Both studies revealed positive impacts on sleep, concentration, and academics, while underlining challenges with program structure, scheduling, and venue.

Future iterations of the 'Space to Breathe' course should retain their strong integrity to the provision of a safe, welcoming class atmosphere and the overarching principles of MBSR. Improvements can be made in terms of locating a permanent, suitable classroom space, expanding the program to include more class offerings and/or times to mediate, more actual meditation practice during in-class sessions, and more background information on the science behind and benefits of meditation. Further, in-class discussions should be oriented in a way that provides clear expectations to participants - a



structure that is easy to follow, perhaps with a set of guided questions, could facilitate more meaningful discussion between group members, especially the more reticent. Finally, more concrete examples of how to apply mindfulness in daily life should be considered and related to program participants, the date and time for the day-long retreat should be positioned at an advantageous time that allows for maximum participation (i.e., not during an exam-heavy portion of the semester), and creative ways to advertise to a larger percent of the student population should be addressed.

### 5.1 Strengths and Limitations

Several limitations must be addressed with the current study. First, we acknowledge the inherent limitations of conducting a study without the use of a control group. A control allows for the study of one variable at a time, pairing theoretically identical groups to observe if outcomes differ when an experiment is performed on only one of the two. In the case of the present study, utilizing a control group that received no MBSR intervention would have allowed the team to understand how, if at all, the MBSR course, specifically, played a role in improving outcomes for which we tested. A future randomized control trial is needed whereby individuals would be randomized to receive either the intervention or no intervention. Second, our sample size was relatively small. A small sample can make for less accurate mean values and gives greater power to the skewing effects of outliers. A larger sample would have countered these negative effects. Third, our administration of the follow-up surveys was conducted only at 6-weeks and long-term follow-up was not feasible.. This is problematic in that our results show only the short-term impact of the intervention, thus, we can only speculate on the long-term benefits of participation in an intervention like the present one. A future study is needed which examines whether these effects are sustained over time. Fourth, only self-report measures were utilized. Though the psychometric scales we administered have strong validity and reliability metrics, self-report measures do have limitations; namely that they are subject to recall and social desirability

bias. A future study is needed which incorporates additional physiological measures that could inform our understanding about the impact of the MBSR course on health outcomes. Fifth, dropout was an issue. Only half of our participants completed the program and provided follow-up data. It will be important to understand why so many students decided not to continue the course in order to make appropriate changes (for example, course content, accessibility, scheduling, culturally appropriate approach, etc.). Finally, a majority of participants were female, which may limit the generalizability of our findings.

Despite these limitations, the study is among the first to examine the effects of a brief MBSR program on a diverse, urban college population, and, to the best of our knowledge, is the first to utilize a mixed methods approach.

## 5.2 Implications

There is still much to be learned about how mindfulness is accepted and used by college students, especially members of minority communities, including African American communities (Spears et al., 2017; Watson et al., 2016). Most of the work that has been done to date on mindfulness programs has focused on relatively homogenous cohorts (Woods-Giscombé & Gaylord, 2014). The current study adds to the small but growing body of research that looks at mindfulness interventions on diverse populations at urban universities in the United States. That it is, to our knowledge, the first to utilize a mixed methods approach to the study of this specific topic and population, is of great benefit. Brief mindfulness-based interventions have the ability to function well in current gaps in psychological care and programs encouraging overall well-being.

Even so, care must be taken to ensure that those with the greatest need are retained in such programs. As mentioned above, our intervention experienced a 50% dropout rate - not uncommon for a study like this, but far from ideal. MBSR has much to offer, but designing MBSR interventions that target

and retain individuals with the greatest mental health need is of tantamount importance. Telemedicine and stepped interventions could play a role in adapting brief MBSR programs to this end. In spite of this current shortcoming, colleges and universities across the U.S. and the rest of the globe are positioned to incorporate brief mindfulness-based interventions into their curricula and counseling. Future research in this area should focus on gaining insights into acceptability and effectiveness of MBSR and related interventions on minority populations, those with the heaviest burden of mental health complaints, and among males. Wherever possible, future studies should strive to incorporate biometric measures.

### 5.3 Conclusion

Mindfulness-based stress reduction programs are a useful tool for supporting mental health and overall well-being among college students. Our findings align with a growing body of recent research in the field of MBSR and constituent programs that supports these claims. Even so, more research is needed to determine the applicability of brief MBSR interventions across differences in race, gender, and socioeconomic status.

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Table 1 - Participant Sociodemographic Data

Variable	N (%)
Gender Male Female Other	4 (9.8) 36 (87.8) 1 (2.4)
Age 18-20 21-29 30-39	7 (17.1) 24 (58.5) 10 (24.4)
Highest level of school achieved High school degree or equivalent (i.e. GED) Some college but no degree Bachelor's degree Graduate degree	8 (19.5) 13 (31.7) 9 (22.0) 11 (26.8)
Employment status Working full time (40+ hours/week) Working part time (<40 hours/week) Unemployed	4 (9.8) 28 (68.3) 9 (22.0)
Annual household income \$0 - \$9,999 \$10,000 - \$24,999 \$25,000 - \$49,999 \$50,000 - \$74,999 \$75,000 - \$100,000 \$100,000+ Prefer not to answer	4 (11.4) 9 (25.7) 9 (25.7) 4 (11.4) 4 (11.4) 4 (11.4) 1 (2.9)
Race White Black or African-American Asian Native Hawaiian or other Pacific Islander From multiple races Other race (please specify)	15 (36.6) 14 (34.1) 6 (14.6) 1 (2.4) 2 (4.9) 3 (7.3)
Ethnicity Not Spanish, Hispanic, or Latino Some Spanish, Hispanic, or Latino group Other	36 (87.8) 4 (9.8) 1 (2.4)
Previous use of CTC services? Yes No	32 (78.0) 9 (22.0)
Previous use of Mind-Body Clinic services? Yes No	17 (41.5) 24 (58.5)

Table 2 - Changes in Psychosocial Measures from Pre- to Post-test

Measure	Pre-test Mean (SD)	Post-test Mean (SD)	t (df)	Sig	Effect size (Cohen's d)
DASS Stress	16.82 (10.12)	12.45 (8.60)	2.45 (21)	0.02	0.47
DASS Anxiety	12.30 (10.40)	8.82 (9.30)	1.90 (21)	0.07	0.35
DASS Depression	9.40 (8.34)	5.40 (6.72)	2.21 (19)	0.04	0.53
Self-Compassion	80.00 (21.71)	91.20 (19.60)	3.83 (20)	0.001	0.54
MAAS	54.24 (12.91)	59.62 (10.93)	2.70 (20)	0.015	0.45
Positive Affect	31.80 (8.80)	31.73 (8.50)	0.02 (21)	0.98	0.01
Negative Affect	19.45 (7.00)	17.20 (6.20)	1.42 (21)	0.20	0.34

Table 3 - Comparison of pre-test scores of enrolled participants versus those who completed the intervention

Measure	Pre-test only (n = 22) Mean (SD)	Pre- and post-test (n = 22) Mean (SD)	F (df)	Sig
DASS Stress	22.45 (9.66)	16.82 (10.12)	3.57 (1, 43)	p = 0.07
DASS Anxiety	14.55 (10.78)	12.30 (10.40)	0.51 (1, 43)	p = 0.48
DASS Depression	18.55 (12.20)	9.73 (8.01)	8.05 (1, 43)	p = 0.01
Self-Compassion	60.40 (20.10)	78.82 (21.90)	8.25 (1, 42)	p = 0.01
MAAS	46.23 (14.20)	54.24 (12.91)	3.74 (1, 42)	p = 0.06
Positive Affect	26.30 (9.10)	31.80 (8.80)	4.17 (1, 43)	p = 0.05
Negative Affect	23.70 (9.50)	19.45 (7.00)	2.77 (1, 42)	p = 0.10

## APPENDIX A

### INTERVIEW GUIDE (for post-program interviews)

'Space to Breathe' Program Evaluation, Spring 2018

#### Introductory Information:

Hello and welcome. Thank you for taking the time to be here – we are really interested in your thoughts and opinions. We are here today to hear your feedback about the 'Space to Breathe' program. We are interested in your opinions and how you think we might improve the program to help other college students engage in more mindful behavior. There are no right or wrong answers, and all comments--both positive and negative--are welcome.

We're audio-recording this session so that we don't miss any of your important comments. Please turn off your cell phone or other devices that might make noise. This audio recording will be kept confidential. We will not use your name during our recorded conversation, and your name will not be associated with any of your comments.

As you know, my thesis is on mindfulness. I'm trying to get a sense of why people are interested in mindfulness, what draws them to a class such as Space to Breathe, and what keeps them there - that is, what they perceive to be the benefits of pursuing an understanding of and engagement with mindfulness practice. In short: Who is attending this class and why? And, does it make any difference in their lives?

1. First of all, what's your location within the GSU universe? Your major, your track, your year, other



pertinent information you'd care to share.

2. What drew you to Space to Breathe - to mindfulness - in the first place?

(Did you have any previous mindfulness exposure?)

(Did any particular life circumstances/experiences propel you toward participation in the class?)

(Are you taking any medications for your mental health?)

(How do you see the role of medication versus the role of mindfulness in managing X? [X being any medical complaint the interviewee has mentioned])

(How does mindfulness affect your ability to cope with mental health issues?)

3. How did you hear about the course?

4. Tell me about your experience with 'Space to Breathe.'

(What was helpful? What did you like about it?)

(What was not helpful? What did you dislike about it?)

(How closely did this course align with your vision of what 'mindfulness' would be? [for this without previous exposure to mindfulness practice])

5. How would you describe "mindfulness," in your own words?

(Do you differentiate between mindfulness and meditation?)

(Did anything about mindfulness surprise you?)

(WHY IS MF IMPORTANT?)

Which is more effective - counseling or mindfulness?

6. How (if at all) did you practice mindfulness on your own, in between the group sessions?

7. What would you like to see more or less of, and why?

Meditation Practice

Science Behind and Benefits of Specific Practices

Discussion

Meditation Tips

Applications in Daily Life

Home Practice

Handouts

Emails

8. Which Practices did you enjoy most, or find most beneficial?

The Body Scan

Awareness of Breathing

Mindful Walking

Mindful Yoga/Movement

Mindfulness of Thoughts & Emotions

Mindfulness of Sound

The STOP Practice

The Retreat (did you attend?) (any big insights or breakthroughs?)

9. What suggestions do you have for improving the program?

(Consider ways to improve: attendance, how much people get out of the weekly groups, how to encourage people to practice strategies on their own)

10. What's your biggest takeaway from the course - what made your time and energy worth it?

11. Do you plan to continue practicing mindfulness/meditation going forward? (Why/why not?)

(Do you see a downside to mindfulness practice? Can you imagine one?)

(Can you point to a dark side of mindfulness practice that you experienced or might expect to experience at some point in time? That is, could mindfulness be 'bad' for you, and if so, how?)

(Does a daily mindfulness practice seem feasible to you? 'Worth' it?)

12. Would you be interested in more advanced offerings?